



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

h.A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,398	11/20/2003	Akira Tokai	1082.1064	5536
21171	7590	09/11/2006	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			RAABE, CHRISTOPHER M	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/716,398	TOKAI ET AL.	
	Examiner	Art Unit	
	Christopher M. Raabe	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. The indication in the Office Action sent July 28, 2006 that the rejection contained therein was a final rejection was in error. This Office Action is intended to replace the above-referenced Office Action and is non-final.
2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 6, 2006 has been entered.
3. Applicant's arguments filed April 6, 2006 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 2879

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1,2,3,7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, in view of Tokai et al. (USPN 2001/0028216) and Todokoro (USPN 2001/0043170).

With regard to claim 1,

Applicants disclose as prior art a light-emitting tube array display device comprising a light-emitting tube array constituted of a plurality of light-emitting tubes arranged in parallel with discharge gas filled therein (page 1, lines 10-16); a light-transmitting supporter abutting a display surface side of the light-emitting tube array for supporting the light-emitting tube array and having electrodes, formed on a surface of the supporter facing the light-emitting tube array, for applying a voltage to the light-emitting tubes (page1, line 18 - page 2, line 3); a light-transmitting adhesive layer formed between the supporter and the light-emitting tube array (page 2, lines 4-7).

Applicants do not disclose as prior art the electrodes crossing the light emitting tubes, a phosphor layer, a rear side substrate, a resin layer, nor do the applicants disclose as prior art the adhesive layer having a refractive index equal to or higher than that of a tube body of each light emitting tube.

Tokai et al. do disclose electrodes crossing the light emitting tubes (X's of fig 4A), a phosphor layer formed on a rear side inner wall of each light emitting tube (413 of fig 6A), a rear side substrate abutting a surface of each light-emitting tube so that the light-emitting tube array is held between the supporter and the rear side substrate (20 of fig 1A); electrodes formed on a

Art Unit: 2879

surface of the rear side substrate facing the light-emitting tubes and extending in a direction crossing the electrodes formed on the surface of the supporter (Y's of fig 4A); and a resin layer filled into a space formed by the display surface sides of the light-emitting tubes and the supporter (paragraph 67), providing a durable addressable display.

Todokoro does disclose an adhesive layer having a refractive index equal to or higher than that of a tube body of each light-emitting tube (paragraph 176, and 206, 219 of fig 13A; see also figs 1,2,14), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the configuration of Tokai et al. and the relationship between the indices of refraction disclosed by Todokoro into the display disclosed by the Applicants as prior art in order to provide a durable, addressable display with reduced optical reflectivity.

With regard to claim 2,

Applicants disclose as prior art a light-emitting tube array display device comprising a light-emitting tube array constituted of a plurality of light-emitting tubes arranged in parallel with discharge gas filled therein (page 1, lines 10-16); a light-transmitting supporter abutting a display surface side of the light-emitting tube array for supporting the light-emitting tube array and having electrodes, formed on a surface of the supporter facing the light-emitting tube array, for applying a voltage to the light-emitting tubes (page1, line 18 - page 2, line 3); a light-transmitting adhesive layer formed between the supporter and the light-emitting tube array (page 2, lines 4-7).

Applicants do not disclose as prior art the electrodes crossing the light emitting tubes, a phosphor layer, a rear side substrate, a resin layer, nor do the applicants disclose as prior art the supporter having a refractive index equal to or higher than that of the adhesive layer.

Tokai et al. do disclose electrodes crossing the light emitting tubes (X's of fig 4A), a phosphor layer formed on a rear side inner wall of each light emitting tube (413 of fig 6A), a rear side substrate abutting a surface of each light-emitting tube so that the light-emitting tube array is held between the supporter and the rear side substrate (20 of fig 1A); electrodes formed on a surface of the rear side substrate facing the light-emitting tubes and extending in a direction crossing the electrodes formed on the surface of the supporter (Y's of fig 4A); and a resin layer filled into a space formed by the display surface sides of the light-emitting tubes and the supporter (paragraph 67), providing a durable, addressable display.

Todokoro does disclose a supporter having a refractive index equal to or higher than that of an adhesive layer (paragraph 176, and 213, 219 of fig 13A; see also figs 1,2,14), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the configuration of Tokai et al. and the relationship between the indices of refraction disclosed by Todokoro into the display disclosed by the Applicants as prior art in order to provide a durable, addressable display with reduced optical reflectivity.

With regard to claim 3,

Applicants disclose as prior art a light-emitting tube array display device comprising a light-emitting tube array constituted of a plurality of light-emitting tubes arranged in parallel with discharge gas filled therein (page 1, lines 10-16); a light-transmitting supporter abutting a display surface side of the light-emitting tube array for supporting the light-emitting tube array and having electrodes, formed on a surface of the supporter facing the light-emitting tube array, for applying a voltage to the light-emitting tubes (page 1, line 18 - page 2, line 3); a light-

Art Unit: 2879

transmitting adhesive layer formed between the supporter and the light-emitting tube array (page 2, lines 4-7).

Applicants do not disclose as prior art the electrodes crossing the light emitting tubes, a phosphor layer, a rear side substrate, a resin layer, nor do the applicants disclose as prior art the adhesive layer having a refractive index equal to or higher than that of a tube body of each light emitting tube, and the supporter having a refractive index higher than that of the adhesive layer.

Tokai et al. do disclose electrodes crossing the light emitting tubes (X's of fig 4A), a phosphor layer formed on a rear side inner wall of each light emitting tube (413 of fig 6A), a rear side substrate abutting a surface of each light-emitting tube so that the light-emitting tube array is held between the supporter and the rear side substrate (20 of fig 1A); electrodes formed on a surface of the rear side substrate facing the light-emitting tubes and extending in a direction crossing the electrodes formed on the surface of the supporter (Y's of fig 4A); and a resin layer formed in a space formed by the light-emitting tubes and the supporter (paragraph 67), providing a durable, addressable display.

Todokoro does disclose an adhesive layer having a refractive index equal to or higher than that of a tube body of each light-emitting tube, and a supporter having a refractive index higher than that of the adhesive layer (paragraph 176, and 206, 213, 219 of fig 13A; see also figs 1,2,14), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the configuration of Tokai et al. and the relationship between the indices of refraction disclosed by Todokoro into the display disclosed by the Applicants as prior art in order to provide a durable, addressable display with reduced optical reflectivity.

Art Unit: 2879

With regard to claim 7,

Applicants disclose as prior art the light-emitting tube array display device.

Applicants do not disclose as prior art each light-emitting tube having a flat portion provided on its surface facing the supporter and a cross section that allows the flat portion to face at least one electrode of the supporter when the supporter abuts the flat portion.

Todokoro does disclose each light-emitting tube having a flat portion provided on its surface facing a supporter and a cross section that allows the flat portion to face at least one electrode of the supporter when the supporter abuts the flat portion (fig 1), simplifying the manufacturing process.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the tube shape of Todokoro into the light-emitting tube array display device disclosed by Applicants as prior art in order to simplify manufacturing.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, Tokai et al., and Todokoro as applied to claim 3 above, and further in view of Bhagavatula et al. (USPN 5984747) and Koike et al. (USPN 20030176124)

With regard to claim 4,

Applicants disclose as prior art a light-emitting tube array display device.

Applicants do not disclose as prior art the refractive index of the tube body of each light-emitting tube being equal to or less than 1.47, the refractive index of the adhesive layer being 1.47-1.50, nor the refractive index of the supporter being equal to or higher than 1.50.

Art Unit: 2879

Bhagavatula et al. do disclose the refractive index of a tube body of each light-emitting tube being equal to or less than 1.47 (column 10, lines 66-67: Corning Code 7740 Pyrex has an index of refraction of 1.47, and fig. 2), reducing optical reflectivity.

Koike et al. do disclose the refractive index of an adhesive layer being 1.47-1.50 (paragraph 177), reducing optical reflectivity.

Todokoro does disclose the refractive index of a supporter being equal to or higher than 1.50 (paragraph 176), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the refractive indices disclosed by Bhagavatula et al, Koike et al., and Todokoro into the light-emitting tube array display device disclosed as prior art by Applicants in order to reduce optical reflectivity.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, Tokai et al., and Todokoro as applied to claims 1,2,3 above, and further in view of Hiroshi (U.S. Patent 5875013).

With regard to claim 5,

Applicants disclose as prior art the light-emitting tube array display device.

Applicants do not disclose as prior art the supporter being a flexible resin sheet.

Hiroshi discloses the supporter being a flexible resin sheet (column 16, lines 54-59), providing a durable display device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a flexible resin sheet disclosed by Hiroshi into the light-emitting tube array

Art Unit: 2879

display device disclosed by the Applicants as prior art in order provide for a durable display device.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, Tokai et al., Todokoro, and Hiroshi as applied to claim 5 above, and further in view of Bhagavatula et al. (U.S. Patent 5984747), Koike et al. (U.S. Pre-grant Publication 2003/0176124), and Kubota et al. (U.S. Pre-grant Publication 2002/0050783).

With regard to claim 6,

Applicants disclose as prior art the light-emitting tube array display device.

Applicants do not disclose as prior art the tube body of each light-emitting tube being made of borosilicate glass, the flexible resin sheet being made of polyethylene terephthalate, and the adhesive layer being made of acrylic resin.

Bhagavatula et al. do disclose a tube body of each light-emitting tube being made of borosilicate glass (column 10, lines 66-67), reducing optical reflectivity.

Koike et al. do disclose an adhesive layer being made of acrylic resin (paragraph 32), reducing optical reflectivity.

Kubota et al. do disclose the flexible resin sheet being made of polyethylene terephthalate (paragraph 44), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials disclosed by Bhagavatula et al., Koike et al. and Kubota et al. into the light-emitting tube array display device disclosed by the Applicants as prior art in order to reduce optical reflectivity.

Art Unit: 2879

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, Tokai et al., and Todokoro as applied to claims 1,2,3 above, and further in view of Kubota et al. (U.S. Pre-grant Publication 2002/0050783).

With regard to claim 9,

Applicants disclose as prior art the light-emitting tube array display device.

Applicants do not disclose as prior art one or more film(s) or substrate(s) having a refractive index higher than that of the supporter, the one or more film(s) or substrate(s) being disposed on a display surface side of the supporter in such a manner that their refractive indices increase successively with distance from the supporter.

Kubota et al. do disclose one or more film(s) or substrate(s) having a refractive index higher than that of a supporter, the one or more film(s) or substrate(s) being disposed on a display surface side of the supporter in such a manner that their refractive indices increase successively with distance from the supporter (paragraphs 138,139 and fig 8), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the additional layers disclosed by Kubota et al. into the light-emitting tube array display device disclosed by Applicants as prior art in order to reduce optical reflectivity.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, Tokai et al., and Todokoro as applied to claim 2 above, and further in view of Bhagavatula et al. (U.S. Patent 5984747), Koike et al. (U.S. Pre-grant Publication 2003/0176124), and Kubota et al. (U.S. Pre-grant Publication 2002/0050783).

Art Unit: 2879

With regard to claim 11,

Applicants disclose as prior art the light-emitting tube array display device.

Applicants do not disclose as prior art the tube body of each light-emitting tube being made of borosilicate glass, the flexible resin sheet being made of polyethylene terephthalate, and the adhesive layer being made of acrylic resin.

Bhagavatula et al. do disclose a tube body of each light-emitting tube being made of borosilicate glass (column 10, lines 66-67), reducing optical reflectivity.

Koike et al. do disclose an adhesive layer being made of acrylic resin (paragraph 32), reducing optical reflectivity.

Kubota et al. do disclose a flexible resin sheet being made of polyethylene terephthalate (paragraph 44), reducing optical reflectivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials disclosed by Bhagavatula et al., Koike et al. and Kubota et al. into the light-emitting tube array display device disclosed by the Applicants as prior art in order to reduce optical reflectivity.

Response to Arguments

11. While the applicant argues that the prior art does not disclose a resin layer filled into a space formed by display surface sides of the light emitting tubes and the supporter, citing the Tokai reference as teaching that the outer surface of the glass tube can be coated with an acrylic or silicon resin, the examiner asserts that a resin layer coating the outer surface of the glass tube will constitute a resin layer filled into a space formed by the display surface sides of the light-emitting tubes and the supporter. Therefore, the rejections of claims 1, 2, and 3 (and subsequent dependent claims) are maintained.

Art Unit: 2879


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR


ASHOK PATEL
PRIMARY EXAMINER